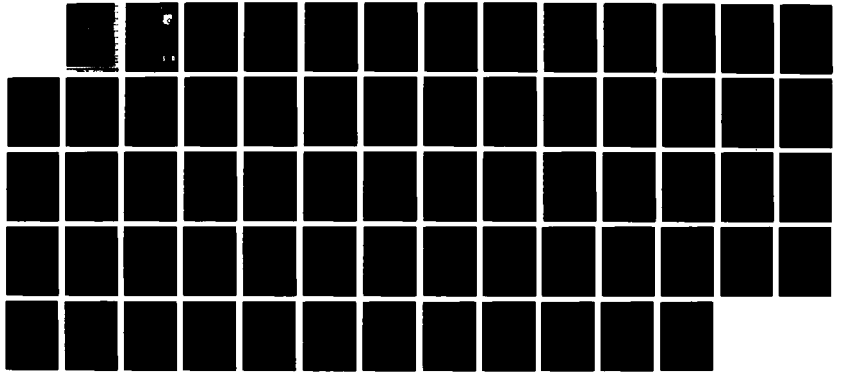
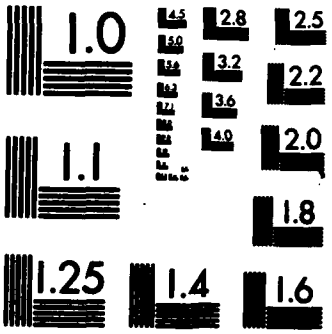
AD-A182 050 INTEGRATED INFORMATION SUPPORT SYSTEM (IISS) VOLUME 6 1/1
NETWORK TRANSACTION.. (U) GENERAL ELECTRIC CO
SCHENECTADY NY PRODUCTION RESOURCES CONSU..
UNCLASSIFIED B GREENBERG ET AL. 01 NOV 85 OM-620142000 F/G 12/5 NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

AFWAL-TR-86-4006
Volume VI
Part 3

INTEGRATED INFORMATION SUPPORT SYSTEM (IISS)
Volume VI - Network Transaction Manager Subsystem
Part 3 - NTM Operator's Manual

General Electric Company
Production Resources Consulting
One River Road
Schenectady, New York 12345

Final Report for Period 22 September 1980 - 31 July 1985

November 1985

PREPARED FOR:

MATERIALS LABORATORY
AIR FORCE WRIGHT AERONAUTICAL LABORATORIES
AIR FORCE SYSTEMS COMMAND
WRIGHT-PATTERSON AFB, OH 45433-6533

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE

1 November 1985

REPORT DOCUMENTATION PAGE

A182 058

1a. REPORT SECURITY CLASSIFICATION: Unclassified	1b. RESTRICTIVE MARKINGS
2a. SECURITY CLASSIFICATION AUTHORITY	3. DISTRIBUTION/AVAILABILITY OF REPORT: Approved for public release; distribution is unlimited.
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE	
4. PERFORMING ORGANIZATION REPORT NUMBER(S)	5. MONITORING ORGANIZATION REPORT NUMBER(S): AFWAL-TR-86-4006 Vol VI, Part 3
6a. NAME OF PERFORMING ORGANIZATION: General Electric Company Production Resources Consulting; 6b. OFFICE SYMBOL (If applicable)	7a. NAME OF MONITORING ORGANIZATION: AFWAL/MLTC
6c. ADDRESS (City, State and ZIP Code): 1 River Road Schenectady, NY 12345	7b. ADDRESS (City, State and ZIP Code): WPAFB, OH 45433-6533
8a. NAME OF FUNDING/SPONSORING ORGANIZATION: Materials Laboratory Air Force Systems Command, USAF; 8b. OFFICE SYMBOL (If applicable): AFWAL/MLTC	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER: F33615-80-C-5155
8c. ADDRESS (City, State and ZIP Code): Wright-Patterson AFB, Ohio 45433	10. SOURCE OF FUNDING NOS: PROGRAM ELEMENT NO. 78011F; PROJECT NO. 7500; TASK NO. 62; WORK UNIT NO. 01
11. TITLE (Include Security Classification): (See Reverse)	
12. PERSONAL AUTHOR(S): Greenberg, Barry, Strohl, Mary Jane and Cross, Judy	
13a. TYPE OF REPORT: Final Technical Report; 13b. TIME COVERED: 22 Sept 1980 - 31 July 1985; 14. DATE OF REPORT (Yr., Mo., Day): 1985 November; 15. PAGE COUNT: 66	
16. SUPPLEMENTARY NOTATION: ICAM Project Priority 6201	The computer software contained herein are theoretical and/or references that in no way reflect Air Force-owned or -developed computer software.

17 COSATI CODES		
FIELD	GROUP	SUB GR
1308	0905	

18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number):

19. ABSTRACT (Continue on reverse if necessary and identify by block number):

This technical manual provides detailed instructions for running IISS. This includes instructions for bringing up and shutting down the (NTM), a description of NTM error codes, and instructions for maintaining NTM tables.

20. DISTRIBUTION/AVAILABILITY OF ABSTRACT: UNCLASSIFIED/UNLIMITED ☒ SAME AS RPT. ☐ DTIC USERS ☐	21. ABSTRACT SECURITY CLASSIFICATION: Unclassified
22a. NAME OF RESPONSIBLE INDIVIDUAL: David L. Judson	22b. TELEPHONE NUMBER (Include Area Code): 513-255-6076; 22c. OFFICE SYMBOL: AFWAL/MLTC

DD FORM 1473, 83 APR EDITION OF 1 JAN 73 IS OBSOLETE.

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE

11. Title

Integrated Information Support System (IISS)
Vol VI - Network Transaction Manager Subsystem
Part 3 - NTM Operator's Manual

PREFACE

This operator's manual covers the work performed under Air Force Contract F33615-80-C-5155 (ICAM Project 6201). This contract is sponsored by the Materials Laboratory, Air Force Systems Command, Wright-Patterson Air Force Base, Ohio. It was administered under the technical direction of Mr. Gerald C. Shumaker, ICAM Program Manager, Manufacturing Technology Division, through Project Manager, Mr. David Judson. The Prime Contractor was Production Resources Consulting of the General Electric Company, Schenectady, New York, under the direction of Mr. Allan Rubenstein. The General Electric Project Manager was Mr. Myron Hurlbut of Industrial Automation Systems Department, Albany, New York.

Certain work aimed at improving Test Bed Technology has been performed by other contracts with Project 6201 performing integrating functions. This work consisted of enhancements to Test Bed software and establishment and operation of Test Bed hardware and communications for developers and other users. Documentation relating to the Test Bed from all of these contractors and projects have been integrated under Project 6201 for publication and treatment as an integrated set of documents. The particular contributors to each document are noted on the Report Documentation Page (DD1473). A listing and description of the entire project documentation system and how they are related is contained in document FTR620100001, Project Overview.

The subcontractors and their contributing activities were as follows:

TASK 4.2

Subcontractors	Role
Boeing Military Aircraft Company (BMAC)	Reviewer
D. Appleton Company (DACOM)	Responsible for IDEF support, state-of-the-art literature search
General Dynamics/ Ft. Worth	Responsible for factory view function and information models

Subcontractors	Role
Illinois Institute of Technology	Responsible for factory view function research (IITRI) and information models of small and medium-size business
North American Rockwell	Reviewer
Northrop Corporation	Responsible for factory view function and information models
Pritsker and Associates	Responsible for IDEF2 support
SofTech	Responsible for IDEF0 support

TASKS 4.3 - 4.9 (TEST BED)

Subcontractors	Role
Boeing Military Aircraft Company (BMAC)	Responsible for consultation on applications of the technology and on IBM computer technology.
Computer Technology Associates (CTA)	Assisted in the areas of communications systems, system design and integration methodology, and design of the Network Transaction Manager.
Control Data Corporation (CDC)	Responsible for the Common Data Model (CDM) implementation and part of the CDM design (shared with DACOM).
D. Appleton Company (DACOM)	Responsible for the overall CDM Subystem design integration and test plan, as well as part of the design of the CDM (shared with CDC). DACOM also developed the Integration Methodology and did the schema mappings for the Application Subsystems.

Subcontractors	Role
Digital Equipment Corporation (DEC)	Consulting and support of the performance testing and on DEC software and computer systems operation.
McDonnell Douglas Automation Company (McAuto)	Responsible for the support and enhancements to the Network Transaction Manager Subsystem during 1984/1985 period.
On-Line Software International (OSI)	Responsible for programming the Communications Subsystem on the IBM and for consulting on the IBM.
Rath and Strong Systems Products (RSSP) (In 1985 became McCormack & Dodge)	Responsible for assistance in the implementation and use of the MRP II package (PIOS) that they supplied.
SofTech, Inc.	Responsible for the design and implementation of the Network Transaction Manager (NTM) in 1981/1984 period.
Software Performance Engineering (SPE)	Responsible for directing the work on performance evaluation and analysis.
Structural Dynamics Research Corporation (SDRC)	Responsible for the User Interface and Virtual Terminal Interface Subsystems.

Subcontractors and other prime contractors under other projects who have contributed to Test Bed Technology, their contributing activities and responsible projects are as follows:

Subcontractors	Role
General Dynamics/ Ft. Worth	Responsible for factory view

Contractors	ICAM Project	Contributing Activities
Boeing Military Aircraft Company (BMAC)	1701, 2201, 2202	Enhancements for IBM node use. Technology Transfer to Integrated Sheet Metal Center (ISMC)
Control Data Corporation (CDC)	1502, 1701	IISS enhancements to Common Data Model Processor (CDMP)
D. Appleton Company (DACOM)	1502	IISS enhancements to Integration Methodology
General Electric	1502	Operation of the Test Bed and communications equipment.
Hughes Aircraft Company (HAC)	1701	Test Bed enhancements
Structural Dynamics Research Corporation (SDRC)	1502, 1701, 1703	IISS enhancements to User Interface/Virtual Terminal Interface (UI/VTI)
Systran	1502	Test Bed enhancements. Operation of Test Bed.

TABLE OF CONTENTS

LIST OF SYMBOLS, ABBREVIATIONS, ACRONYMS

AP	Application Process
APC	Application Process Cluster
API	Application Process Interface
CDMRP	Common Data Model Request Processor
COMM	Communications Handler
CPCI	Computer Program Configuration Item
DBMS	Data Base Management System
DML	Data Manipulation Language
ICAM	Integrated Computer Aided Manufacturing
IDSS	Integrated Decision Support System
IISS	Integrated Information Support System
IPC	Inter Process Communication
LAN	Local Area Network
MCMM	Manufacturing Control Material Management
MDL	Message Definition Language
MM	Message Manager
MO	Maintain Operability
MPU	Message Processing Unit
MRP	Materials Requirements Planning
MSG	Message
NTM	Network Transaction Manager
OS	Operating System
PM	Process Manager
QA	Quality Assurance
SS	System Specification
UI	User Interface
VAX	Trademark of Digital Equipment Corporation: 32 bit minicomputer
VMS	Trademark of Digital Equipment Corporation: The VAX OS

SECTION 1

RUNNING THE IISS

1.1 Location of Runtime Modules

In order to run IISS, the NTM executable modules MONITR, NTMRVMPU, NTCDMMPU, NTCOVMPU, NTUIVMPU, and NTT1VMPU must be resident in the directory in which IISS will be run. All of the data files (for NTM tables, queues, and sysgen parameters) must also be in this directory. All executable modules of AP's to be run in the IISS environment must be in directories known to the NTM.

A directory is known to the NTM via an entry in the Directory Table. This entry contains the two character directory ID (as used in the AP Naming Convention) and the actual directory name (not to exceed twelve characters including the period).

Finally, the executable module MPUGEN must reside in the directory in which the IISS will be run. This allows the operator to modify the sysgen parameters and run without having to move files.

1.2 Sysgen Parameters

Prior to running the IISS, and "Instance" must be assigned to the NTM. This Instance ID allows multiple IISS environments to run simultaneously. On the VAX, the separate IISS instances must run in separate VAX Groups (where a VAX User Identification Code (UIC) = [group id, member id]). To assign an instance ID, MPUGEN is run. The MPUGEN menu includes a choice for modifying the current IISS Instance.

1.3 IISS Startup

The IISS environment on each host within the IISS system is started individually under control of the local host operating system. Once the IISS operator has logged on to the local host under the appropriate system directory, the invocation of a command file will cause the local operating system to load and execute the monitor AP (Monitor AP is the NTM system component responsible for coordinating IISS start up). On the VAX, the command file is "IISS" and is executed as follows:

```
@IISS (return)
                    * * * * * CLEANUP * * * * *
              * * * * * BEGINNING IISS START UP * * * * *

MRV START UP SUCCESSFUL.
CDM START UP SUCCESSFUL.
UIV START UP SUCCESSFUL.
COV START UP SUCCESSFUL.
TlV START UP SUCCESSFUL.

              * * * * * IISS START UP COMPLETE * * * * *
            ************************************************
            ***  INTEGRATED INFORMATION SUPPORT SYSTEM   ***
            ***       NETWORK TRANSACTION MANAGER        ***
            ***                                          ***
            ************************************************

ENTER OPERATOR COMMAND (OR HELP)

COMM LINK VI IS ACTIVE.
```

In the above example, CLEANUP is the pre-start up file initialization phase in which message logs and queues are "cleaned up" and NTM files are assigned. File Delete Errors during cleanup will occur. This may not indicate an error; it is possible that the particular file was not created during the previous execution. These error messages may usually be ignored.

Once IISS start up has begun, start up status messages are displayed to the IISS operator console. These messages indicate which IISS components have been successfully initiated and where errors have occurred in start up processing. In the above example, all local APC's (MRV, CDM, UIV, COV, TIV) have started successfully as has the VAX-IBM comm link (VI). If an error occurs during the start up of an APC, an error message would be displayed. If a Component APC (MRx, CDM, UIx, COx, where x is the host identifier) fails, the IISS start up would fail and the Monitor AP terminate. The following is an example of such an occurrence:

```
MRV START UP SUCCESSFUL
CDM START UP FAILED: FAIL CODE: 30001
TIMEOUT ON WAIT FOR MPU TABLE STATUS REQUEST
ERROR IN MODULE STRTUP ERROR CODE: 30020
COMPONENT APC FAILED AT START UP
```

```
      (return to host's os command level)
```

If a non-component APC fails, start up continues; the IISS can run without the non-component APC's being active. The following is an example of this situation:

```
      MRV START UP SUCCESSFUL.
      CDM START UP SUCCESSFUL.
      UIV START UP SUCCESSFUL.
      COV START UP SUCCESSFUL.
      T1V START UP FAILED: FAIL CODE: MTR01
      TIMEOUT ON WAIT FOR TABLE STATUS REQUEST

      * * * * *  IISS START UP COMPLETE * * * * *
      COMM LINK VI IS ACTIVE.
```

The IISS Central Node (VAX) can operate in the IISS environment without any Remote Node being active. If, during IISS start up, any or all of the comm link start up requests fail, start up processing will continue and normal IISS processing will be available to the local host.

```
      MRV START UP SUCCESSFUL.
      CDM START UP SUCCESSFUL.
      UIV START UP SUCCESSFUL.
      COV START UP SUCCESSFUL.
      T1V START UP SUCCESSFUL.

      * * * * * IISS START UP COMPLETE * * * * *
      VI LINK START FAILED: FAIL CODE 30016
```

The above situation is currently not applicable to a Remote Node. The current implementation of the NTM requires Remote Nodes to have an active link to the Central Node to run in the IISS environment. If the above example were on a Remote Node, it would look as follows (Note: the comm link to the Central Note is started immediately after the Monitor APC is initiated):

```
      MRI START UP SUCCESSFUL.
      IV LINK START FAILED; FAIL CODE: 30016
      ERROR IN MODULE LKTOCN ERROR CODE: 30016
      COMM LINK FAILED AT START UP
```

SECTION 2

IISS OPERATOR COMMANDS

2.1 Introduction

The NTM currently supports 12 operator commands. They are as follows:

1. Shutdown IISS (SD)
2. Shutdown APC (SC)
3. Start APC (ST)
4. Shutdown Comm Link (LS)
5. Start Comm Link (SL)
6. Cancel IISS Shutdown (CN)
7. Display IISS Status (DS)
8. Display Active AP's (DA)
9. Enable a SIGERR Messages (SE)
10. Disable SIGERR Messages (SO)
11. Select Logging Features (LG)
12. Start New Log File (SN)

"HELP" will display the list of operator commands. The processing of these commands is fairly straightforward. "Shutdown IISS" is more complex and will be covered in the section of this manual on shutting down the IISS (Section 3). Except for the commands "CN" and "DS", the operator is prompted for additional information - either an APC name or a Link ID. This data is verified and the command is executed. Between the time the operator enters the requested command data and the time at which the command processing is complete, the operator console is disabled for further input. Therefore, there may be no overlapping of operator commands. The results of the command will be displayed at the console.

2.2 Shutdown APC

This command causes an APC anywhere in the IISS environment to be shutdown. The operator is prompted for the same of the APC and the command status is displayed to the operator. Only non-component APC's may be shutdown via operator command.

```
ENTER OPERATOR COMMAND (OR HELP)
  SC (return)
ENTER APC NAME
  T1V (return)
```

```
T1V HAS TERMINATED
```

Other possible status returns for this command are:

- APC NOT IN APC STATUS TABLE
- APC IS INACTIVE
- NO RESPONSE FROM APC: ASSUMED TERMINATED
- INVALID COMMAND FOR COMPONENT APC

2.3 Start APC

This command enables the IISS operator to start an APC. Currently only non-component APC's on the local host may be started via operator command. As in the Shutdown APC command, the operator is prompted for the name of the APC.

```
ENTER OPERATOR COMMAND (OR HELP)
›ST (return)
ENTER APC NAME
›T1V(return)
T1V START UP SUCCESSFUL.
```

Other possible status returns for this command are:

- APC NOT IN APC STATUS TABLE
- APC IS ALREADY ACTIVE
- APC START UP FAILED: FAIL CODE: MTRxx

2.4 Shutdown Comm Link

This command is invoked to shutdown the communications link to a remote host. The operator is prompted for the id of the link to be shutdown.

```
ENTER OPERATOR COMMAND (OR HELP)
›LS(return)
ENTER LINK ID
›VH(return)
COMM LINK VH HAS TERMINATED.
```

Other possible status returns for this command are:

- LINK-ID NOT IN LINK STATUS TABLE
- LINK-ID IS INACTIVE
- NO RESPONSE FROM LINK ID VH: ASSUMED TERMINATED

2.5 Start Comm Link

This command is invoked to start the communications link to a remote host. The operator is prompted for the id of the link to be started.

```
ENTER OPERATOR COMMAND (OR HELP)
›SL(return)
ENTER LINK ID
 ›VH(return)
COMM LINK VH IS ACTIVE
```

Other possible status returns for this command are:

- LINK-ID NOT IN LINK STATUS TABLE
- LINK-ID IS ALREADY ACTIVE
- LINK-ID LINK START UP FAILED: FAIL CODE MTRxx

2.6 Display IISS Status

This command displays the current status of all IISS components.

```
ENTER OPERATOR COMMAND (OR HELP)
›DS(return)
›››››››››››››››››››SYSTEM STATUS‹‹‹‹‹‹‹‹‹‹‹‹‹‹‹‹‹‹‹

HOST VAX IS ACTIVE
HOST HL6 IS INACTIVE
HOST IBM IS INACTIVE

APC MRV IS ACTIVE
APC UIV IS ACTIVE
APC COV IS ACTIVE
APC CDM IS ACTIVE
APC T1V IS ACTIVE
APC COH IS INACTIVE

LINK VH IS ACTIVE
LINK VI IS INACTIVE
LINK IH IS INACTIVE
```

2.7 Display Active AP's

This command enables the IISS operator to set a list of

the active AP's on a particular APC. The operator is prompted for the name of the APC who's active AP's are to be displayed.

```
ENTER OPERATOR COMMAND (OR HELP)
›DA(return)
ENTER APC NAME
›T1V(return)

THE ACTIVE AP'S ON APC ARE AS FOLLOWS:

AP NAME: ap-name
ABORT CHARACTERISTICS: ap-abort-characteristic
ORIGINAL SOURCE: ap-original-source

(repeated for each active ap on the APC)
```

Other possible status returns for this command are:

- APC NOT IN APC STATUS TABLE
- APC IS INACTIVE
- NO RESPONSE FROM APC: ASSUMED TERMINATED
- NO ACTIVE AP'S ON APC

2.8 Enable SIGERR Messages

This command sets the condition that all SIGERR messages that arrive at MONITR will be displayed on the Operator's console.

```
ENTER OPERATOR COMMAND (OR HELP)
›SE (return)
›(new prompt indicates SIGERR Messages are enabled)
```

2.9 Disable SIGERR Messages

This command prevents SIGERR messages from being displayed at the operator's console. As most SIGERR messages are notifications of internal AP problems, the operator may choose this option to restrict console displays to NTM errors only. This mode is the default one. When the IISS starts up, the displaying of SIGERR messages at the operator's console is disabled.

```
ENTER OPERATOR COMMAND (OR HELP)
›SO (return)
```

›(new prompt indicates that SIGERR messages have been disabled)

2.10 Select Logging Features (LG)

This command starts a dialog with the operator to select IISS logging features. At IISS startup, complete logging is enabled; all IISS messages will be logged at all APCs. The IISS messages are logged in the file NTMLOG.DAT.

```
ENTER OPERATOR COMMAND (OR HELP)
›LG (return)

SELECT LOGGING FUNCTION COMMAND

SELECT ONE FROM THE FOLLOWING FUNCTIONS.

1.      DISABLE ALL MESSAGE LOGGING.
2.      ENABLE LOGGING OF ALL MESSAGES.
3.      ENABLE SELECTIVE LOGGING:
        (CHOICES WILL FOLLOW)
4.      QUIT
ENTER CHOICE:
›
```

If choice 1 is selected:

```
›1 (return)

LOGGING HAS BEEN DISABLED.
›
```

will appear. All message logging is now disabled.

If choice 2 is selected:

```
›2 (return)

Logging of all messages is enabled.
›
```

will appear. All IISS messages will now be logged. (the IISS startup default)

If choice 3 is selected:

The first question to appear is

```
DO YOU WISH TO DISABLE ANY MESSAGE PRIORITIES?
(1:  YES  2:  NO)
ENTER RESPONSE (1/2):
›
```

If 1 is selected, the next choice that appears is:

```
DISABLE HOT (H) OR COLD (C) MESSAGES?
RESPONSES:  1:  HOT  2:  COLD)
ENTER CHOICE (1/2):
›
```

The operators choice will disable the requested priority. If, for example, the operator enters an invalid choice, he is asked to repeat the entry. Three tries are given before the selective logging program aborts and returns control to the operators normal monitoring sequence.

The next choice that appears if "3" was selected from the original menu is

```
DO YOU WISH TO DISABLE ANY MESSAGE CATEGORIES?
(1:  YES  2:  NO)
ENTER RESPONSE (1/2):
›
```

If 1 is selected, the existing categories will be displayed one by one for the operator to select the categories that he wishes to disable. The following is an example dialog for this feature.

```
DISABLE CATEGORY:  A?
(1:  YES  2:  NO)
ENTER RESPONSE (1/2):
› 1

DISABLE CATEGORY:  B?
(1:  YES  2:  NO)
ENTER RESPONSE (1/2):
› 1

DISABLE CATEGORY:  C?
(1:  YES  2:  NO)
ENTER RESPONSE (1/2):
› 1

DISABLE CATEGORY:  D?
```

```
(1:  YES  2:  NO)
ENTER RESPONSE (1/2):
› 1

DISABLE CATEGORY:  E?
(1:  YES  2:  NO)
ENTER RESPONSE (1/2):
› 1

DISABLE CATEGORY:  F?
(1:  YES  2:  NO)
ENTER RESPONSE (1/2):
› 1

DISABLE CATEGORY:  G?
(1:  YES  2:  NO)
ENTER RESPONSE (1/2):
› 1

DISABLE CATEGORY:  H?
(1:  YES  2:  NO)
ENTER RESPONSE (1/2):
› 1

DISABLE CATEGORY:  I?
(1:  YES  2:  NO)
ENTER RESPONSE (1/2):
› 1

DISABLE CATEGORY:  J?
(1:  YES  2:  NO)
ENTER RESPONSE (1/2):
› 1
```

The last selective logging choice allows the operator to disable logging at particular APCs. The choices and a sample dialog follow:

```
DO YOU WISH TO MODIFY LOGGING BY PARTICULAR APCS?
(1:  YES  2:  NO)
ENTER RESPONSE:  (1/2)
› 1

SOURCE/DESTINATION LOGGING CHOICES:

 1.      LOG AT MESSAGE SOURCE APCS ONLY.
 2.      LOG AT BOTH SOURCE AND DESTINATION APCS.
```

```
3.      LOG AT ALL APCS WHERE LOGGING IS ENABLED.
ENTER RESPONSE (1/2/3):
› 3
DO YOU WISH TO DISABLE ANY APCS?
(1:  YES  2:  NO)
ENTER RESPONSE (1/2):
› 1
DISABLE APC:  MRV?
(1:  YES  2:  NO)
ENTER RESPONSE (1/2):
› 1
DISABLE APC:  UIV?
(1:  YES  2:  NO)
ENTER RESPONSE (1/2):
› 1
DISABLE APC:  T1V?
(1:  YES  2:  NO)
ENTER RESPONSE (1/2):
› 2
DISABLE APC:  COM?
(1:  YES  2:  NO)
ENTER RESPONSE (1/2):
› 2
DISABLE APC:  CDM?
(1:  YES  2:  NO)
ENTER RESPONSE (1/2):
› 2

SELECT LOGGING FUNCTION COMPLETE.
›
```

2.11 Start a New Log File (SN)

```
ENTER OPERATOR COMMAND (OR HELP)
SN (return)

A new LOGFILE has been started
›
```

On the VAX, a new version of the logfile, NTMLOG.DAT will be started. This allows the operator to isolate the logs for specific tests or times.

SECTION 3

SHUTTING DOWN THE IISS

The operator command "Shutdown IISS" is invoked when the entire IISS system is to be shutdown. IISS shutdown is accomplished in four phases as follows:

Phase 1	Notify users that IISS shutdown is pending
Phase 2	Request the shutdown of non-component APC's and remote hosts.
Phase 3	Request the shutdown of network communications
Phase 4	Shutdown component APC's

When the shutdown command is entered, the operator is prompted for a "time until shutdown." The time value (in minutes) entered by the operator will determine the elapsed time until shutdown processing (phase 2) actually begins. Phase 1 will be executed only if time until shutdown is one minute or more. Otherwise, shutdown will proceed immediately to phase 2, thereby denying active AP's the time to shut down gracefully. During Phase 1, IISS users are notified that a system shutdown is pending and they should prepare to close their session. After shutdown has been requested, only operator commands "Display IISS Status", "Display Active AP's", and "Cancel Shutdown" will be accepted. It is only during phase 1 of shutdown that the operator may choose to cancel the shutdown request. If the operator requests the "Cancel Shutdown" command, IISS users are notified that the shutdown has been cancelled and normal IISS processing is resumed. After the elapsed time until shutdown has expired, shutdown processing begins with the shutdown of all active non-component APC's and active remote hosts. All components not responding to the shutdown request within a certain time interval will be assumed terminated. When all non-component APC's and remote hosts shutdown in phase 2 have been accounted for, phase 3 is entered. During this phase network communications are terminated. When all active comm links have been shutdown, phase 4 of shutdown begins and all component APC's are shutdown. Finally, when all other NTM components have terminated, Monitor AP concludes shutdown processing and ends execution.

The following is an example of the IISS shutdown request:

ENTER OPERATOR COMMAND (OR HELP)

```
› SD(return)
ENTER MINUTES ('X' TO EXIT) UNTIL SHUTDOWN
› 1(return)
SHUTDOWN WILL BEGIN IN 1 MINUTE

(one minute later)
BEGINNING IISS SHUTDOWN
***APC T1V HAS SHUTDOWN***
***COMM LINK VH HAS SHUTDOWN***
***APC UIV HAS SHUTDOWN***
***APC CDM HAD SHUTDOWN***
***APC COV HAS SHUTDOWN***
***APC MRV HAS SHUTDOWN***

***IISS SHUTDOWN COMPLETE***
```

Control is returned to the host operating system.

SECTION 4

ERROR CODES

4.1 MPU Processing Error Codes (31XXX)

MPU processing codes are those errors which are detected by an MPU during its normal processing activities. Upon the occurrence of an MPU processing error, the following error message is displayed to the IISS operator console:

```
MPU PROCESSING ERROR:  SOURCE:  MPU-NAME
ERROR CODE:  CODE FOR ERROR OCCURRENCE
ERROR INFO:  FURTHER CLARIFICATION OF THE ERROR
```

The "source" of the MPU processing is the name of the MPU that detected the error condition. The "error info" is data relevant to the error condition. As an example, on a 31001 error (Mailbox Write) the name of the mailbox where the error occurred is given. Table names, file names, and (host) system return codes are other examples of information supplied in an MPU processing error message. In most cases, it will be necessary to call the IISS system programmer to investigate the cause of the problem.

The MPU processing error codes are as follows:

31001	MAILBOX WRITE ERROR
31002	MAILBOX CREATE ERROR
31003	NO READ ON MAILBOX
31004	MAILBOX DISCONNECT ERROR
31005	EVENT WAIT ERROR
31006	SET TIMER ERROR
31007	TABLE MAPPING ERROR (VAX)
31008	JOB PROCESS INFORMATION ERROR (VAX)
31009	PROCESS START ERROR
31010	PROCESS ABORT ERROR
31016	TABLE READ ERROR
31017	TABLE WRITE ERROR
31018	CDM ACCESS ERROR
31019	MESSAGE ROUTING ERROR
31020	OS CALL ERROR
31021	TIMEOUT ERROR
31022	COBOL CALL ERROR
31023	EXCEPTION CONDITION
31024	TABLE ENTRY NOT FOUND

31025 TABLE ENTRY NOT DELETED
31026 INVALID SEARCH FIELD
31027 CANCEL TIMEOUT ERROR
31028 IPC ERROR
31029 FILE RE-WRITE ERROR
31030 FILE INDEX ERROR
31031 QUEUE TABLE ERROR
31033 INVALID FUNCTION CODE
31034 SIBLING NOT FOUND
31011 PROCESS NOT FOUND
31100 FILE READ ERROR
31200 FILE WRITE ERROR
31300 CLOSE FILE ERROR
31400 OPEN FILE ERROR
31500 FILE START ERROR
31600 FILE DELETE ERROR

4.2 AP Interface Error Codes (32XXX)

AP interface errors are those errors occuring in the AP interface (to the NTM) and detected by the MPU during message processing. All errors of this type involve invalid message header field values. For example, upon the occurrence of an AP interface error where an invalid message category is given in the header, the following message will be displayed to the IISS operator console:

```
AP INTERFACE ERROR; SOURCE:  mpu-name
ERROR CODE:  32001
ERROR INFO:  errant-ap-name
```

The "source" of the message refers to the MPU that detected the error and the "ERROR INFO" indicates the name of the application process sending the message where the error has occurred. These errors are caused by the AP of AP Interface providing invalid data n the message header. The application designer should check to insure that proper "Data Length", "Message Type", and "Destination AP Name" arguments are passed to the AP Interface. Otherwise, it will be necessary for the IISS system programmer to investigate the errant AP Interface.

The AP interface error codes are as follows:

32001 INVALID MESSAGE CATEGORY
32002 INVALID HEADER FORMAT
32003 INVALID HEADER LENGTH
32004 INVALID HEADER BINARY/NATIVE FLAG

32005 INVALID MESSAGE TYPE
32006 INVALID MESSAGE SOURCE APNAME
32007 INVALID MESSAGE SOURCE AP INSTANCE
32008 INVALID MESSAGE SOURCE APC NAME
32009 INVALID HEADER PROCESSING CODE
32010 INVALID HEADER CONTINUATION INDICATOR
32011 INVALID DATA LENGTH
32012 INVALID MESSAGE PRIORITY

4.3 Resource Unavailable Error Codes (33XXX)

A "RESOURCE UNAVAILABLE ERROR" occurs either when an application process requests an IISS system resource that is currently unavailable or when a table-full is encountered when trying to write an entry to an MTM table. In either case, the following message is displayed to the IISS operator console:

RESOURCE UNAVAILABLE MESSAGE FROM: mpu-name
ERROR CODE: 33001
RESOURCE: unavailable-resource-name

The "SOURCE" refers to the MPU where the resource unavailable condition was detected. "RESOURCE" is the name of the requested resource, such as a table name or a destination AP of APC name.

There is currently only one "RESOURCE AVAILABLE" error code which covers both cases.

33001 TABLE FULL
RESOURCE UNAVAILABLE

The "RESOURCE" portion of the message will indicate the type of resource in question.

4.4 Table Error Codes (35XXX)

Table error codes provide the return status from the table access routines. The return of one of these codes does not necessarily imply that an error has occured. The MPU will interpret the returns in the context of the call and will inform Monitor only where an error condition is deemed to exist. As an example, the END-OF-TABLE return is given at the end of the table routines READ-ALL function. In the case where the MPU is polling the table (such as when checking for timed-out message pairs) this is not considered to be an error. However, when the MPU's records show the existence of an entry, a return of

END-OF-TABLE before the entry is found does indicate an error condition.

There are also occurrences of table error conditions that are of interest to the AP's. The MPU will send an error message to the AP on these occurrences. In most cases, these conditions will occur while the AP is waiting for a return from an API Service. The services are therefore able to interpret the error message and return the appropriate status code. In those cases where control has been returned to the AP, the MPU uses the SIGERR message convention to inform the AP of the error occurrence. The AP must of course be in test mode in order to receive these messages.

The table error/status codes are:

00000 SUCCESSFUL RETURN
31024 ENTRY NOT FOUND (on a READ-SEARCH access)
35002 END OF TABLE (on a READ-ALL access)
33001 TABLE FULL (on a WRITE-NEW access)

4.5 Monitor AP Error Codes (30XXX)

Monitor AP error codes are associated with errors detected by the Monitor AP during its normal processing. Most errors detected by the Monitor are at system start up. These errors may cause the Monitor to terminate depending on where the error occurred. Errors may also occur during shutdown or operator command processing. When an error is detected, the error code and a descriptive message are displayed at the operator's console. Errors pertaining to entries not found in tables (30010-30013) are probably indications of inconsistencies between tables. Timeout errors (30001, 30002, 30015) imply that a process the Monitor AP expects a message from is not responding. In most cases it will be necessary to call the IISS system programmer to investigate the problem.

The following is a list of all currently defined monitor error codes:

30001 TIMEOUT ON WAIT FOR MPU TABLE STATUS REQUEST
30002 TIMEOUT ON WAIT FOR MPU START UP STATUS
30005 INVALID EVENT RECEIVED
30010 ENTRY NOT FOUND IN APC STATUS TABLE
30011 ENTRY NOT FOUND IN LINK STATUS TABLE
30012 ENTRY NOT FOUND IN LINK STATUS TABLE
30013 ENTRY NOT FOUND IN HOST-LINK-TABLE

30015	LINK START TIMEOUT
30016	LINK FAILED AT START UP
30017	COMM AP START-UP FAILED
30020	COMPONENT APC FAILED AT START UP
30025	NO RESPONSE FROM CENTRAL NODE (VAX)
30030	ERROR IN GET TERMINAL ID

SECTION 5

NTM TABLE MAINTENANCE

5.1 Overview

This section describes the procedures for maintenance of the NTM tables. The NTM uses the tables described in this section to maintain system information and current status. Some of the NTM tables are global to all MPU components on a host while some are local to each MPU. It is anticipated that in the future these tables will be kept and configured in the CDM (Common Data Model) and will be the responsibility of the CDA (Common Data Administrator). For the time being, however, when a change is made to the IISS which affects the system configuration (for example, the addition of a new AP), certain tables must be manually updated to reflect these changes.

The tables which are to be maintained by the IISS system operator are as follows:

- Authority Check Table (ACT)

  Provides indication of whether or not message access to an AP requires authorization.

- AP Cluster Status Table (APC)

  Provides both the host location within the IISS and the current operational status of an application process cluster (APC)

- AP Information Table (API)

  Provides the name of the APC on which an application resides in the IISS

- AP Characteristics Table (APT)

  Provides the processing characteristics of all application processes in the IISS environment.

- Message Category Table (CAT)

  Provides information pertaining to specific NTM message processing based on message category.

- Host Status Table (HST)

  Provides the current operational status of a host machine on the IISS.

- Link Status Table (LST)

  Provides the current operational status of a communication link between two hosts on the IISS.

- Directory Table (DIR)

  Provides directory identifiers, their full directory names, and the length (in bytes) of the full directory name. At present this name is restricted to 12 bytes including the period.

It should be noted that there are additional NTM tables but they are dynamic in nature and do not require data initialization.* Because this document is concerned only with those tables requiring modification due to system configuration changes, a discussion of these dynamic tables is omitted. All of the NTM tables are fully described in the NTM Development Specification in Section 3.5.

Given a change to the IISS system configuration, one or more of the above tables will need to be updated. The modification of any of these tables is a simple and straightforward procedure involving editing a table

---

* In the previous edition of this document the AP Operating Information table (APO) was identified as a static table. Due to it's nature, it has been reconfigured as a dynamic table and is therefore, no longer of concern here.

initialization file to make the necessary changes. These table init files are maintained in the NTM system directory on each host in the IISS system. The file names are of the format "xxxTBL" where "xxx" is the three character table identifier.

The specific table initialization data file names are as follows:

VAX	HL6	IBM
HSTTBL.DAT	HSTTBL.D	
APCTBL.DAT	APCTBL.D	
LSTTBL.DAT	LSTTBL.D	
APTTBL.DAT	APTTBL.D	
APITBL.DAT	APITBL.D	
ACTTBL.DAT	ACTTBL.D	
CATTBL.DAT	CATTBL.D	

The above table initiation files contain data which appears as a string of characters. Each record in the file represents one table entry. Therefore, to add a new entry to a table, one has only to add another entry to the table initiation file. Similarly, to delete or modify a table entry, the specific record in the initiation file should be deleted or modified. It is critical that the alignment of data in these records remain intact: any errors introduced during the editing process will cause problems at system run time. For this reason, great care should be taken when modifying any table initialization file. When editing a file, check to make sure the new or modified entry is in line with all of the other file entries.

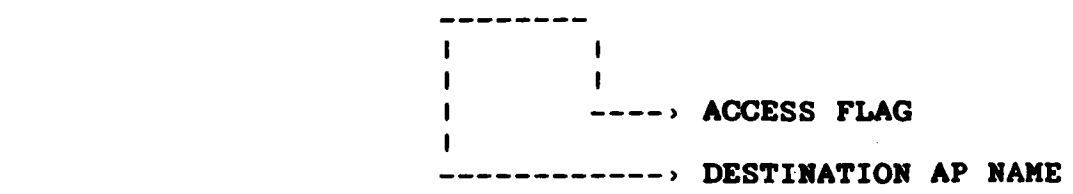
5.2 Table Descriptions

In the following section, the structure of above tables and an example of an initialization data record for each will be described. This should be used as a guide when updating any of the NTM tables. For further information regarding these tables and a description of individual fields, see the "IISS Test Bed Network Transaction Manager Development Specification." A list of legal table values for each data item is given in Section 4.5 of this document.

ACT - AUTHORITY CHECK TABLE

FIELD NAME	SIZE	TYPE
DESTINATION AP NAME	8	ALPHANUMERIC
ACCESS FLAG	1	ALPHANUMERIC

TABLE INITIALIZATION FILE ENTRY (ACTTBL)

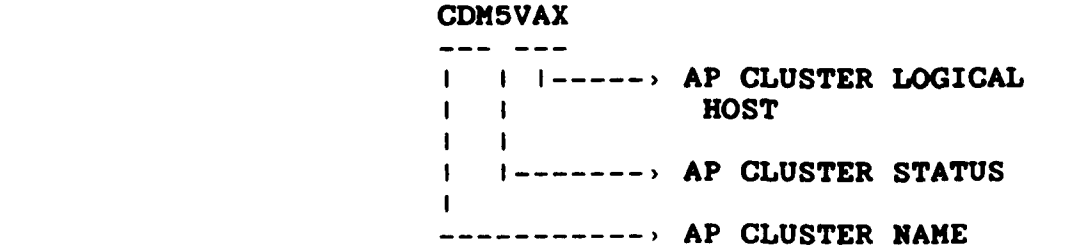


NOTE: The authority check is based on the 'generic' AP name. The access restrictions are directory independent.

APC - AP CLUSTER STATUS TABLE

FIELD NAME	SIZE	TYPE
AP CLUSTER NAME	3	ALPHANUMERIC
AP CLUSTER STATUS	1	NUMERIC
AP CLUSTER LOGICAL HOST	3	ALPHANUMERIC

TABLE INITIALIZATION FILE ENTRY

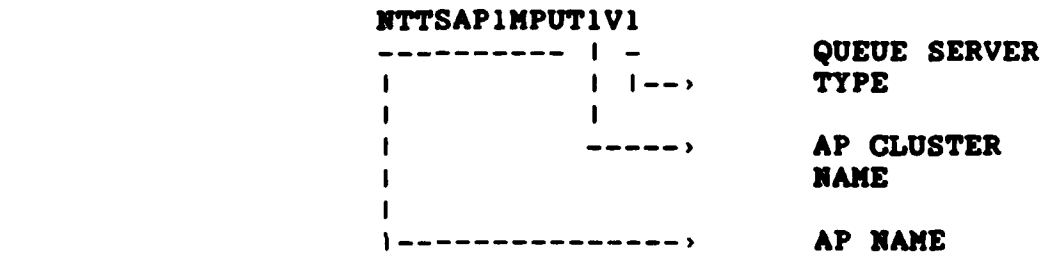


NOTE: The value assigned to "status" will in fact determine whether the APC is initiated at startup.

API - AP INFORMATION TABLE

FIELD NAME	SIZE	TYPE
AP NAME	10	ALPHANUMERIC
AP CLUSTER NAME	3	ALPHANUMERIC
QUEUE SERVER TYPE	1	ALPHANUMERIC

TABLE INITIALIZATION FILE ENTRY (APITBL)

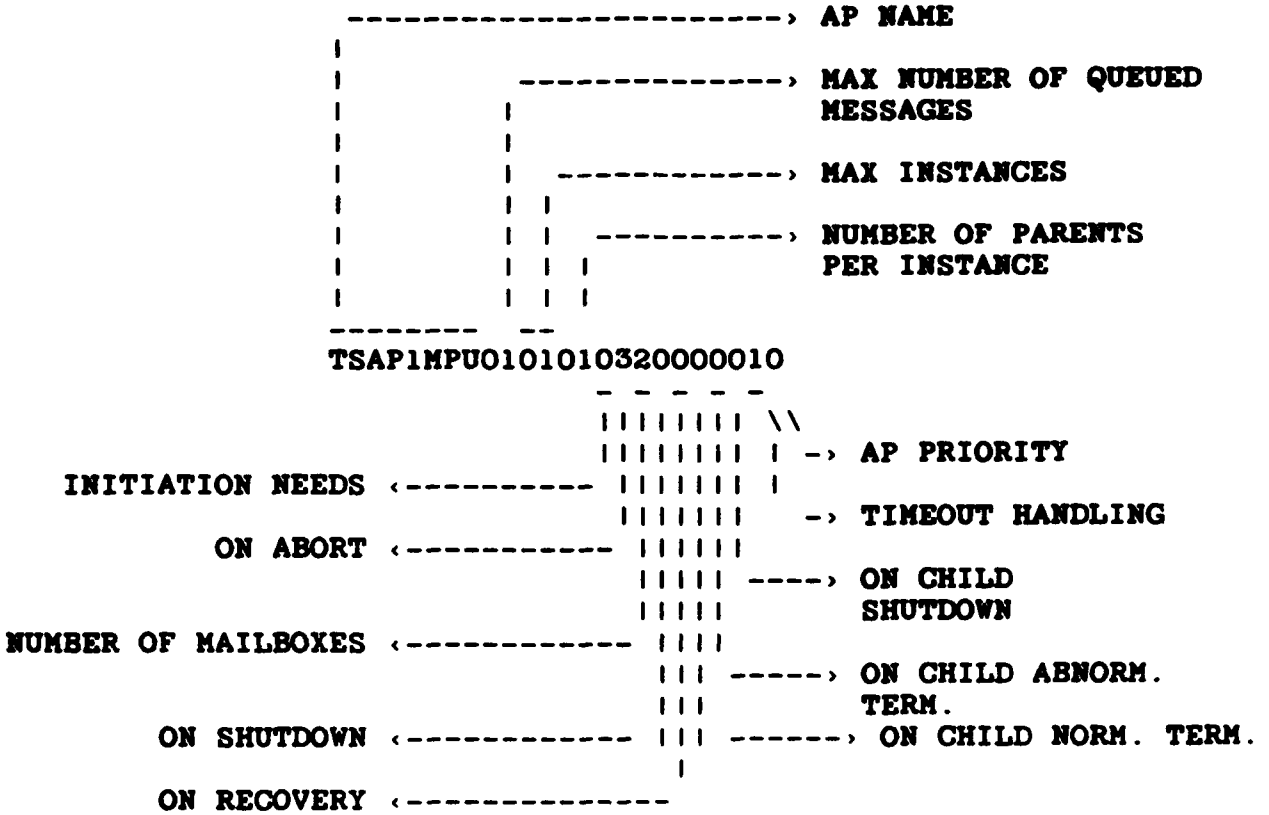


NOTE: The API table is directory dependent. As there may be different versions of an AP residing in different directories, those versions may also be assigned to different APC's.

APT - AP CHARACTERISTICS TABLE

NAME	SIZE	TYPE
AP NAME	8	ALPHANUMERIC
MAX. NUMBER OF QUEUED MESSAGES	2	NUMERIC
MAX. INSTANCES	2	NUMERIC
NUMBER OF PARENTS PER INSTANCE	2	NUMERIC
INITIATION NEEDS	1	NUMERIC
ON ABORT	1	NUMERIC
NUMBER OF MAILBOXES	1	NUMERIC
ON SHUTDOWN	1	NUMERIC
ON RECOVERY	1	NUMERIC
ON CHILD NORMAL TERM.	1	NUMERIC
ON CHILD ABNORM TERM.	1	NUMERIC
ON CHILD SHUTDOWN	1	NUMERIC
TIMEOUT HANDLING	1	NUMERIC
AP PRIORITY	1	NUMERIC

TABLE INITIALIZATION FILE ENTRY (APTTBL)

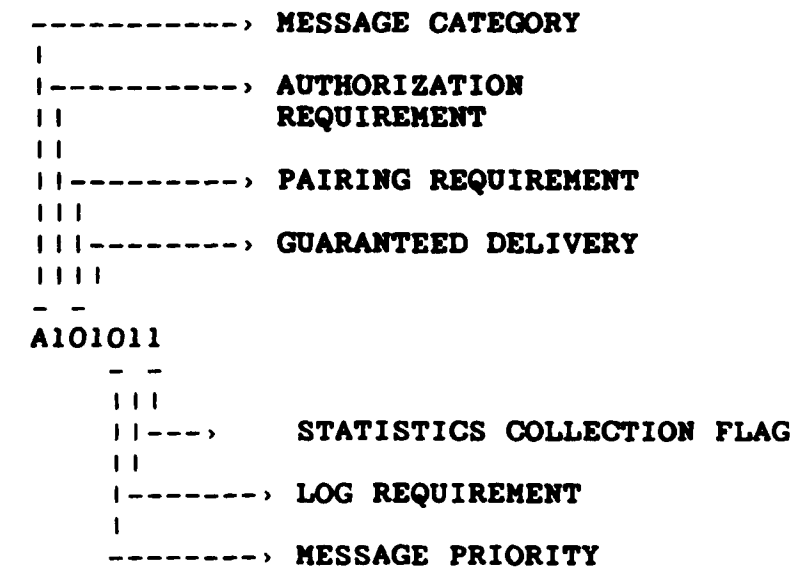


NOTE: The APT table is directory independent. It is assumed that a given AP will have a single set of characteristics regardless of it's directory location or the number of existing versions. The values in this table drive the NTM's processing of an AP. It is critical that they are defined correctly.

CAT - MESSAGE CATEGORY TABLE

FIELD NAME	SIZE	TYPE
MESSAGE CATEGORY	1	ALPHA
AUTHORIZATION REQUIREMENT	1	NUMERIC
PAIRING REQUIREMENT	1	NUMERIC
GUARANTEED DELIVERY	1	NUMERIC
MESSAGE PRIORITY	1	NUMERIC
LOG REQUIREMENT	1	NUMERIC
STATISTICS COLLECTION FLAG	1	NUMERIC

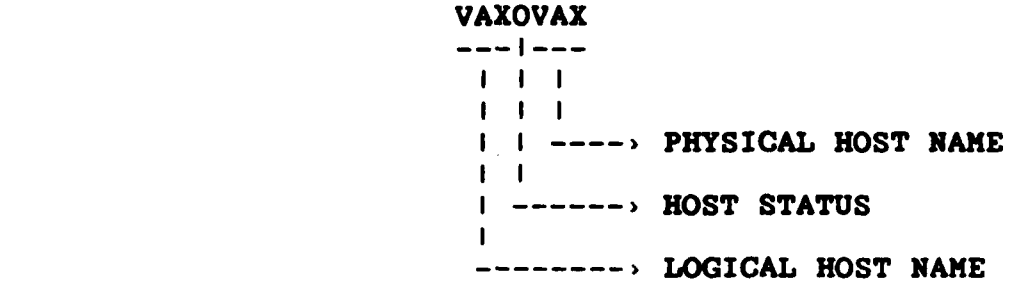
TABLE INITIALIZATION FILE ENTRY (CATTBL)



HST - HOST STATUS TABLE

FIELD NAME	SIZE	TYPE
LOGICAL HOST NAME	3	ALPHANUMERIC
HOST STATUS	1	NUMERIC
PHYSICAL HOST NAME	3	ALPHANUMERIC

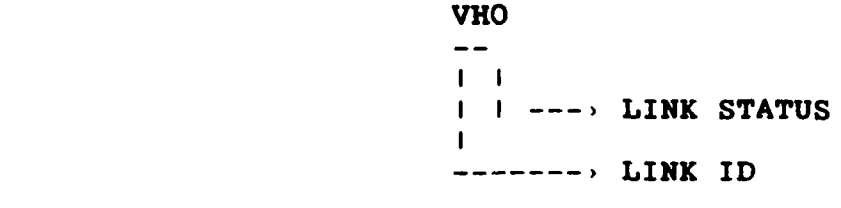
TABLE INITIALIZATION FILE ENTRY (HSTTBL)



LST - LINK CLUSTER STATUS TABLE

FIELD NAME	SIZE	TYPE
LINK ID	2	ALPHA
LINK STATUS	1	NUMERIC

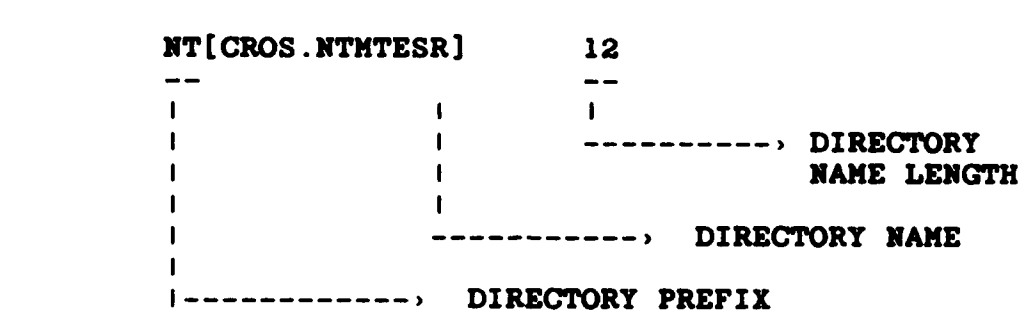
TABLE INITIALIZATION FILE ENTRY



DIR - DIRECTORY TABLE

FIELD NAME	SIZE	TYPE
DIRECTORY PREFIX	2	ALPHANUMERIC
DIRECTORY NAME	20	ALPHANUMERIC
DIRECTORY NAME LENGTH	2	ALPHANUMERIC

TABLE INITIALIZATION FILE ENTRY (DIRTBL)



NOTE: All directory prefixes used by AP's in the IISS must be defined in this table.

5.3 Monitor AP Internal Table

The monitor AP has a special internal table, called the Host-Link Information Table (HLT), which provides the monitor with information regarding remote IISS hosts, the comm links used to communicate with these remote hosts, and the remote monitor APs. This table is maintained as a sysgen parameter.

5.4 When to Modify a Table

Host Status Table.

The Host Status Table is modified when a new host is added to the IISS configuration. The host status entry should be initialized to "0" (inactive).

AP Cluster Status Table.

The AP Cluster Status Table is modified under two

circumstances: (1) when a new APC is added to the IISS configuration, or (2) when the initial APC status is to be modified. The APC status differs from the host or link status in that there is more than one initial status possible; a value of "5" is assigned if the APC is to be initiated during IISS start up; a value of "2" is assigned if it is not to be initiated at start up.

Link Status Table.

The Link Status Table is modified when a new host, and therefore new comm links, are to be added to the system configuration. The link status entry should be initialized to "0" (inactive).

AP Characteristics Table.

The AP Characteristic Table must be modified when an AP is added or removed from the system configuration or when a characteristic of an AP changes. The characteristics of an application process are specified by the application designer based on the list of characteristics supported by the NTM. These values must be supplied at the time the new AP is introduced to the IISS environment.

AP Information Table.

This table is modified when a new application process is added to the system configuration. The system administrator determines, based on the database supporting the application, which AP cluster the new AP is to reside on. If an application process is moved from one APC to another, the API table must be modified to reflect this change. The AP's chaining support requirement (Queue Server Type Value) is supplied by the AP developer.

Authority Check Table.

A new entry is made to the authority check table when a new application process is added to the system or when the authority restriction of an AP is changed. The application designer determines whether or not messages sent to the new AP require authorization.

Message Category Table.

Modification of the Message Category Table is necessary

only when a new message category is created or when the processing requirements implied by the message category are changed.

Directory Table.

Modification of the Directory Table is required when a new directory is added to the IISS configuration.

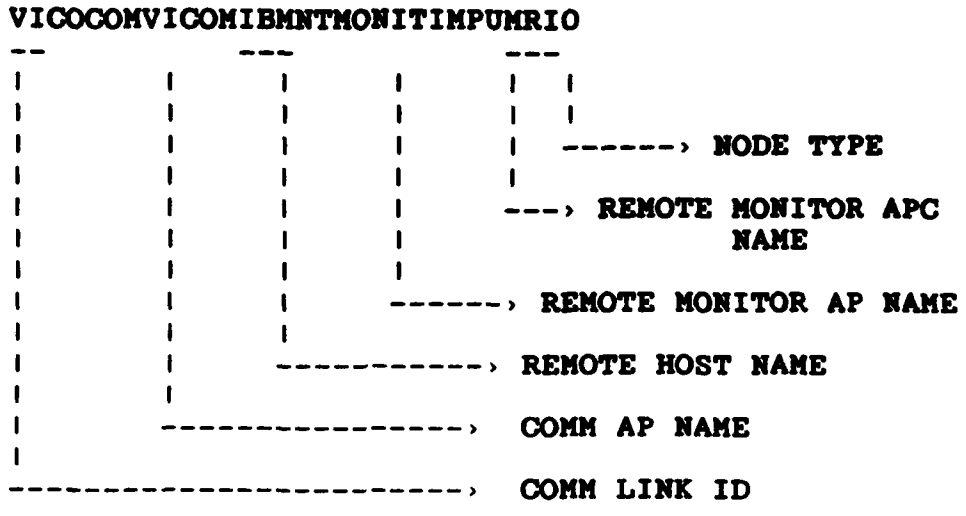
Host-Like Information Table.

When a new host is introduced into the IISS environment, a new entry must be made in this table. This is accomplished by adding REC-N (where N is the next number available) to the include file BASYSG.INC. The specific values of the new entry will be stored in this file. In addition, the value for "INIT-LINK-COUNT" must be updated to reflect the actual number of links that must be established at startup. The new record and volumes are read into the sysgen data file by running MPUGEN to create a default file.

Below is a description of the fields of the Host-Link Information Table:

HLT - HOST-LINK INFORMATION TABLE (INTERNAL TO THE MONITOR AP)

FIELD NAME	SIZE	TYPE
COMM LINK ID	2	ALPHANUMERIC
COMM AP NAME	10	ALPHANUMERIC
REMOTE HOST NAME	3	ALPHANUMERIC
REMOTE MONITOR AP NAME	10	ALPHANUMERIC
REMOTE MONITOR APC NAME	3	ALPHANUMERIC
NODE TYPE	1	NUMERIC **


VICOCOMVICOMIBMNTMONITIMPUMRIO
NODE TYPE
REMOTE MONITOR APC NAME
REMOTE MONITOR AP NAME
REMOTE HOST NAME
COMM AP NAME
COMM LINK ID

5.5 Table Values

The following is a list of legal values for the table fields.

Access Flag (ACT)

0 - Restricted Access (requires authorization)
1 - Open Access

AP Cluster Status (APC)

1 - Active
2 - Unavailable (will not be started during startup)
3 - Shutting Down
4 - In Start Up
5 - Start APC at IISS Start Up

AP Priority (APT)

0 - Default AP Priority (all present all IISS AP's will be assigned the same priority)

Authorization Requirement (CAT)

0 - Message Does Not Require Authorization
1 - Message Requires Authorization

Guaranteed Delivery (CAT)

0 - No Guaranteed Delivery
1 - Guaranteed Delivery Services Required on Message

Host Status (HST)

0 - Inactive
1 - Active
2 - In Start Up
3 - In Shutdown

Initiation Needs (APT)

0 - No Restriction
1 - Requires AP Init Message
2 - Start From Terminal (UI Only)

Link Status (LST)

0 - Inactive
1 - Active
2 - Initiated (Waiting Response)
3 - Comm AP is active but link to remote host is not

Log Requirement (CAT)

0 - Message is not to be Logged
1 - Message is to be Logged

Message Priority (CAT)

0 - Low Priority
1 - High Priority

Node Type (HLT)

0 - IISS Remote Node
1 - IISS Central Node

Number of Mailboxes (APT)

0 - AP Does Not Require Mailboxes
1 - AP Supports a Cold and an ACK Mailbox only
2 - AP Supports Cold, ACK, and Hot Mailboxes

On Abort (APT)

1 - Run to Completion
2 - Send Abort Message to AP
3 - Abnormally Terminate AP

On Child Abnormal Termination (APT)

0 - No Message to AP
1 - Message to AP Required
2 - Terminate Parent AP

On Child Normal Termination (APT)

0 - No Message to AP
1 - Message to AP Required
2 - Terminate Parent AP

On Child Shutdown (APT)

0 - No Message to AP
1 - Message to AP Required
2 - Terminate Parent AP

On Recovery (APT)

0 - AP Has No Recovery Logic
1 - AP Has Internal Recovery Logic

On Shutdown (APT)

0 - AP Has No Shutdown Logic
1 - AP Has Logic To Gracefully Shut Itself Down

Pairing Requirement (CAT)

0 - Message Not Paired
1 - Message Paired

Queue Server Type (API)

0 - No Chaining Support Required
1 - Child AP Chaining Support Required
2 - Message Chaining Support Required

Statistics Collection Flag (CAT)

0 - No Statistics Collected On Message
1 - Statistics Collected On Message

Timeout Handling (APT)

0 - Paired Messages Not Handled
1 - Cancel Message Pair On Timeout
2 - Abort AP On Timeout
3 - Do Not Cancel Pair (Renew Timeout Period)

SECTION 6

TROUBLESHOOTING SUGGESTIONS

There may be times when something completely unexpected occurs or something expected doesn't occur. This section addresses what these situations might look like and what to do when they are detected. These problems tend to be host specific and therefore will be discussed as such.

VAX EXAMPLES:

1. If the IISS is started while various components (MPU's) within the same group are still executing, the following may be observed:

```
@IISS

                    * * * * * CLEANUP * * * * *
            * * * * * BEGINNING IISS START UP* * * * *
%COB-F-INVDECDAT, invalid decimal data
$
```

   To correct this situation, the operator must stop all currently running MPU's in the group using the "STOP Process Name" command under VMS and re-enter the IISS command procedure.

2. If, during normal IISS operation, the operator console does not respond and the system appears to be hung up, the operator may abort the IISS process by entering a "CTRL Y" character. Once at the host operating system command level, all MPU's must be stopped via the "STOP" command under VMS.

3. It is possible that after "* * * * BEGINNING IISS START UP * * * *" is displayed to the console, the host operating system command level prompt is returned with no indication as to what happened to the IISS. The problem here may involve terminal device assignment conflicts. The operator should log off of the system, log back on and try again. If the problem persists, call the IISS system programmer.

APPENDIX A

NTM LOG UTILITY

Description - The NTM log utility is a tool which provides the following functions:

1. Selection of NTM log records based upon any combination of the following fields:

   A. Date
   B. Time
   C. Destination Application Program Name
   D. Destination Application Program Cluster Name
   E. Source Application Program Name
   F. Source Application Program Cluster Name
   G. Message Type
   H. Message Category

2. Online display of selected NTM log records.

3. File creation of selected NTM log records.

4. File creation of selected NTM log records formatted per online display option.

Processing Options -

1. Selection Criteria

   A. Date - To select on the date field, a beginning and ending date must be entered per the following format:

      DD-MMM-YYYY where - 'DD' represents the day
                        - 'MMM' represents the month
                        - 'YYYY' represents the year

      Example - 01-MAR-1985

      Date Field Options:

      1. Enter date per required format.

      2. Leave the date field blank to default to the

current date.

3. Enter one or more asterisks to use the following defaults:

   01-JAN-0001 - FOR BEGINNING DATE
   31-DEC-9999 - FOR ENDING DATE

B. Time - To select on the time field, a beginning and ending time must be entered using the following format:

   HH:MM:SS.ss where - 'HH represents hours
   'MM' represents minutes
   'SS' represents seconds
   'ss' represents hundreths of a second

   Time Field Options:

   1. Enter time per required format.

   2. Leave the time field blank to use the following defaults:

      00:00:00.00 - FOR BEGINNING TIME
      23:59:59.59 - FOR ENDING TIME

   3. Enter a partial time and use the default value so the remaining positions of the time field (i.e., hours, hours and minutes, or hours, minutes, and seconds only).

      Example - 09:____ DEFAULTS TO
      09:00:00 WHEN ENTERED FOR THE BEGINNING TIME
      AND 09:59:59 WHEN ENTERED FOR THE ENDING TIME

C. Destination Application Program Name
Destination Application Program Name Field Options:

   1. Enter a 10-character destination application program name.

   2. Leave the destination application program name field

blank to use the following default: 'MTNTMONITV'.

D. Destination Application Program Cluster Name
Destination Application Program Cluster Name Field Options:

1. Enter a 3-character destination application program cluster name.

2. Leave the destination application program cluster name field blank to use the following default: 'MRV'.

E. Source Application Program Name
Source Application Program Name Field Options:

1. Enter a 10-character source application program name.

2. Leave the source application program name blank to use the following default: 'NTNTMONITV'.

F. Source Application Program Cluster Name
Source Application Program Cluster Name Field Options:

1. Enter a 3-character source application program cluster name.

2. Leave the source application program cluster name blank to use the following default: 'MRV'.

G. Message Type - Enter a 2-character message type
- A default message type is not available
- A blank message type will be ignored and treated as though message type was not selected.

H. Message Category - Enter a 1-character message category
- A default message category is not available
- A blank message category will be ignored and treated as though message category was not selected.

2. Online Display Option

When the "online display" option is selected, each NTM log

record which satisfies the selection criteria will be displayed on the terminal. Each displayed record consists of two or three screens. The first screen displays the NTM log header information (positions 1-127), while the second and third screens display the NTM log data information (positions 128-2042). The third screen will only appear when the NTM log record being displayed contains more than 960 characters of data. After each screen is displayed, the following options are available:

A. You may continue to the next sequential screen by pressing the carriage return.

B. You may select to display the first screen (NTM log header information) for the next selected NTM log record.

C. You may terminate displaying of selected NTM log records.

3. File Creation of Selected NTM Log Records

When the "create an NTM log file" option is selected, each NTM log record which satisfies the selection criteria will be written as raw data to the user-specified file name or when a file name is not specified, the following default file name will be created in the current user's directory: NTMUTIL.DAT

4. File Creation of Selected NTM Log Records Formatted per Online Display Option

When this option is selected, each NTM log record which satisfies the selection criteria will be written in the format of the display option screens to the user-specified file name or when a file name is not specified, the following default file name will be created in the current user's directory: NTMRPT.DAT

Miscellaneous Notes:

1. The input NTM log may be a fixed or variable length file with a record length not exceeding 2042 characters. When an input NTM log file is not specified, the following default file name will be used and accessed in the current user's directory: NTMLOG.DAT

2. Upper and lower case characters are acceptable as input. When a lower case character is entered in a selection field, the character will be converted to the equivalent upper case character and used as such for all further displays and file selection.

3. Any termination of the program after having selected the creation of an output file will result in the creation of the requested file.

EXAMPLE ONE

Reformats all NTMLOG.DAT records.

No interactive display of selected records.

Creates formatted output file NTMRPT.DAT.

```
RUN NTMUTIL

       ***** NTM LOG ANALYSIS UTILITY STARTED *****

PLEASE ENTER THE NAME OF THE NTM LOG FILE TO BE ANALYZED:
NTM LOG FILE TO BE ANALYZED DEFAULTS TO: NTMLOG.DAT

WOULD YOU LIKE TO CREATE A FILE CONTAINING THE SELECTED
NTM LOG RECORDS? (Y/N): NO

WOULD YOU LIKE TO CREATE A FILE CONTAINING THE SELECTED
NTM LOG RECORDS IN THE ONLINE DISPLAY FORMAT? (Y/N): YES

PLEASE ENTER THE FILE NAME:
         DEFAULT FILE NAME: NTMRPT.DAT

WOULD YOU LIKE TO SELECT ON DATE? (Y/N): N

WOULD YOU LIKE TO SELECT A DESTINATION AP NAME? (Y/N): no

WOULD YOU LIKE TO SELECT A DESTINATION APC NAME? (Y/N): n

WOULD YOU LIKE TO SELECT A SOURCE AP NAME? (Y/N):

WOULD YOU LIKE TO SELECT A SOURCE APC NAME? (Y/N):

WOULD YOU LIKE TO SELECT A MESSAGE CATEGORY? (Y/N):

NO SELECTION CRITERIA HAS BEEN ESTABLISHED
ALL RECORDS WILL BE SELECTED

WOULD YOU LIKE TO CONTINUE PROCESSING SELECTED CRITERIA? (Y/N): Y

WOULD YOU LIKE TO HAVE THE NTM LOG DISPLAYED? (Y/N): Y

PROCESSING IS COMPLETE

NUMBER OF RECORDS READ      = 000000548
NUMBER OF MATCHES FOUND     = 000000548

THE FOLLOWING FILE HAS BEEN CREATED CONTAINING 000025208 RECORDS -
NTMRPT.DAT


WOULD YOU LIKE TO RUN THE NTM LOG UTILITY AGAIN? (Y/N): N

$
```

EXAMPLE TWO

Selects records from NTM14MAY.DAT having a destination APC name of "MRV" and time stamp in the range of 12:00:00 - 12:34:59.

Selected records are displayed online.

Output files NTMLOG.DAT and RPT14MAY.DAT are created.

```
RUN NTMUTIL

                ***** NTM LOG ANALYSIS UTILITY STARTED *****

PLESE ENTER THE NAME OF THE NTM LOG FILE TO BE ANALYZED:
NTM14MAY.DAT

WOULD YOU LIKE TO CREATE A FILE CONTAINING THE SELECTED
NTM LOG RECORDS? (Y/N): Y

PLEASE ENTER THE OUTPUT NTM LOG FILE NAME: NEWLOG.DAT

WOULD YOU LIKE TO CREATE A FILE CONTAINING THE SELECTED
NTM LOG RECORDS IN THE ONLINE DISPLAY FORMAT? (Y/N): Y

PLESE ENTER THE FILE NAME: RPT14MAY.DAT

WOULD YOU LIKE TO SELECT ON DATE? (Y/N): Y

PLEASE ENTER THE FILE NAME: RPT14MAY.DAT

WOULD YOU LIKE TO SELECT ON DATE? (Y/N): Y

ENTER BEGINNING DATE (DD-MMM-YYYY): *
      BEGINNING DATE DEFAULTS TO  : 01-JAN-0001
ENTER ENDING    DATE (DD-MMM-YYYY): *
      ENDING    DATE DEFAULTS TO  : 31-DEC-9999

WOULD YOU LIKE TO SELECT ON TIME? (Y/N): Y
ENTER BEGINNING TIME  (HH:MM:SS): 12
      BEGINNING TIME DEFAULTS TO: 12:00:00
ENTER ENDING    TIME  (HH:MM:SS): 12:34
      ENDING    TIME DEFAULTS TO: 12:34:59

WOULD YOU LIKE TO SELECT A DESTINATION AP NAME? (Y/N):

WOULD YOU LIKE TO SELECT A DESTINATION APC NAME? (Y/N): Y
ENTER DESTINATION APC NAME (MAX - 3 CHAR):
      DESTINATION APC NAME DEFAULTS TO   : MRV

WOULD YOU LIKE TO SELECT A SOURCE AP NAME? (Y/N):

WOULD YOU LIKE TO SELECT A SOURCE APC NAME? (Y/N):

WOULD YOU LIKE TO SELECT A MESSAGE TYPE? (Y/N):

WOULD YOU LIKE TO SELECT A MESSAGE CATEGORY? (Y/N):
```

```
SELECTING ON THE FOLLOWING CRITERIA:

DATE RANGE: 01-JAN-0001 THRU 31-DEC-9999
TIME RANGE: 12:00:00.00 THRU 12:34:59.59
DESTINATION APC NAME: MRV

WOULD YOU LIKE TO CONTINUE PROCESSING SELECTED CRITERIA (Y/N):

WOULD YOU LIKE TO HAVE THE NTM LOG DISPLAYED? (Y/N): Y
```

SELECTED NTM LOG RECORD 00001 PAGE 000001

DATE		: 14-MAY-1985	MESSAGE SERIAL NUMBER	:	0004525
TIME		: 12:32:47.33	PROCESSING CODE	:	1
LOG	APC	: MRV	MESSAGE CATEGORY	:	E
LOG	STATUS	: TS000	AP PRIORITY	:	0
HEADER	FORMAT	: A	INTEGRITY CHECK FLAG	:	0
HEADER	LENGTH	: 092	LOG REQUIREMENT	:	1
DATA	LENGTH	: 0017	STATISTICS COLLECTION FLAG	:	1
BINARY/NATIVE FLAG		: N	TEST FLAG	:	0
MESSAGE PRIORITY		: 0	DELAY TRIGGER FLAG	:	0
MESSAGE TYPE		: TS	DELAY TIME TRIGGER :		
DEST AP NAME		: NTNTMONITV	DELAY TRIGGER CONDITON:		
DEST INSTANCE		: 00	ORIGINAL SOURCE	:	NTNTMONITV00MRV
DEST APC NAME		: MRV	LOGICAL CHANNEL ID	:	001
SRC AP NAME		: NTNTMRVMPU	CONTINUATION INDICATOR	:	0
SRC INSTANCE		: 00			
SRC APC NAME		: MRV			

YES - FOR NEXT RECORD NO - TO STOP DISPLAYING PRESS ENTER - TO CONTINUE

SELECTED NTM LOG RECORD 000001 PAGE 000002

12345 67890 12345 67890 12345 67890 12345 67890 12345 67890
TS000

END OF DATA

YES - FOR NEXT RECORD NO - TO STOP DISPLAYING PRESS ENTER - TO CONTINUE

```
                    SELECTED NTM LOG RECORD 000002      PAGE 000003

DATE                    : 14-MAY-1985   MESSAGE SERIAL NUMBER : 0004526
TIME                    : 12:32:48.21   PROCESSING CODE       : 1
LOG        APC          : MRV           MESSAGE CATEGORY      : E
LOG        STATUS       : LV000         AP PRIORITY           : 0
HEADER     FORMAT       : A             INTEGRITY CHECK FLAG  : 0
HEADER     LENGTH       : 092           LOG REQUIREMENT       : 1
DATA       LENGTH       : 0017          STATISTICS COLLECTION
                                        FLAG                  : 1
BINARY/NATIVE FLAG      : N             TEST FLAG             : 0
MESSAGE PRIORITY        : 0             DELAY TRIGGER FLAG    : 0
MESSAGE TYPE            : LV            DELAY TIME TRIGGER    :
BEST AP  NAME           : NTNTMONITV    DELAY TRIGGER
                                        CONDITION             :
BEST INSTANCE           : 00            ORIGINAL SOURCE:NTNTMONITV00MRV
BEST APC NAME           : MRV           LOGICAL CHANNEL ID    : 001
SRC  AP  NAME           : NTNTMRVMPU    CONTINUATION INDICATOR: 0
SRC  INSTANCE           : 00
SRC  APC NAME           : MRV

YES -                     NO -                      PRESS ENTER -
FOR NEXT RECORD           TO STOP DISPLAYING        TO CONTINUE: Y

                    SELECTED NTM LOG RECORD 000003      PAGE 000005

DATE                    : 14-MAY-1985   MESSAGE SERIAL NUMBER : 0004527
TIME                    : 12:32:48.66   PROCESSING CODE       : 1
LOG        APC          : MRV           MESSAGE CATEGORY      : G
LOG        STATUS       : 0000          AP PRIORITY           :
HEADER     FORMAT       : A             INTEGRITY CHECK FLAG  :
HEADER     LENGTH       : 092           LOG REQUIREMENT       :
DATA       LENGTH       : 0000          STATISTICS COLLECTION
                                        FLAG                  :
BINARY/NATIVE FLAG      : N             TEST FLAG             :
MESSAGE PRIORITY        : 1             DELAY TRIGGER FLAG    :
MESSAGE TYPE            : AL            DELAY TIME TRIGGER
                                        FLAG                  :
DEST AP  NAME           : NTNTMRVMPU    DELAY TRIGGER
                                        CONDITION             :
DEST INSTANCE           :               ORIGINAL SOURCE:NTNTMONITV00MRV
DEST APC NAME           : MRV           LOGICAL CHANNEL ID    : MRV
SRC  AP  NAME           : NTNTMONITV    CONTINUATION INDICATOR: 0
SRC  INSTANCE           : 00
SRC  APC NAME           : MRV
YES -                     NO -                      PRESS ENTER -
FOR NEXT RECORD           TO STOP DISPLAYING        TO CONTINUE: NO
```

```
PROCESSING IS COMPLETE

NUMBER OF RECORDS READ      = 000000095
NUMBER OF MATCHES FOUND     = 000000027

THE FOLLOWING FILE HAS BEEN CREATED CONTAINING 000000027 RECORDS -
NEWLOG.DAT


THE FOLLOWING FILE HAS BEEN CREATED CONTAINING 000001242 RECORDS -
RPT14MAY.DAT


WOULD YOU LIKE TO RUN THE NTM LOG UTILITY AGAIN? (Y/N): N

$
```

EXAMPLE THREE

Select message type "AL" records having a date in the range of 22-FEB-1985 thru 31-DEC-9999 and a time range of 14:00:00 - 14:35:59.

Selected records are written to NTMUTIL.DAT and formatted on file NTMRPT.DAT.

```
RUN NTMUTIL

            ***** NTM LOG ANALYSIS UTILITY STARTED *****

PLEASE ENTER THE NAME OF THE NTM LOG FILE TO BE ANALYZED:
NTMLOG.DAT;1

WOULD YOU LIKE TO CREATE A FILE CONTAINING THE SELECTED
NTM LOG RECORDS? (Y/N): Y

PLEASE ENTER THE UTPUT NTM LOG FILE NAME:
        DEFAULT OUTPUT NTM LOG FILE NAME: NTMUTIL.DAT

WOULD YOU LIKE TO CREATE A FILE CONTAINING THE SELECTED
NTM LOG RECORDS IN THE ONLINE DISPLAY FORMAT? (Y/N): Y

PLEASE ENTER THE FILE NAME:
         DEFAULT FILE NAME: NTMRPT.DAT

WOULD YOU LIKE TO SELECT ON DATE? (Y/N): Y
ENTER BEGINNING DATE (DD-MMM-YYYY): 22-FWE-1985

INVALID BEGINNING MONTH - FWE

ENTER BEGINNING DATE (DD-MMM-YYYY): 22-FEB-1985
ENTER ENDING    DATE (DD-MMM-YYYY): 22-FEB-198U

INVALID ENDING DATE   - 22-FEB-198U

ENTER ENDING    DATE  (DD-MMM-YYYY): *
      ENDING    DATE DEFAULTS TO   : 31-DEC-9999

WOULD YOU LIKE TO SELECT ON TIME? (Y/N): Y
ENTER BEGINNING TIME  (HH:MM:SS): AA

INVALID BEGINNING TIME - AA

ENTER BEGINNING TIME  (HH:MM:SS): 14:
      BEGINNING TIME DEFAULTS TO: 14:00:00
ENTER ENDING    TIME  (HH:MM:SS): 14:35
      ENDING    TIME DEFAULTS TO: 14:35:59

WOULD YOU LIKE TO SELECT A DESTINATION AP NAME? (Y/N):

WOULD YOU LIKE TO SELECT A DESTINATION APC NAME? (Y/N):

WOULD YOU LIKE TO SELECT A SOURCE AP NAME? (Y/N):
```

```
WOULD YOU LIKE TO SELECT A SOURCE APC NAME? (Y/N):

WOULD YOU LIKE TO SELECT A MESSAGE TYPE? (Y/N):
ENTER MESSAGE TYPE (MAX - 2 CHAR): AL

WOULD YOU LIKE TO SELECT A MESSAGE CATEGORY? (Y/N):

SELECTING ON THE FOLLOWING CRITERIA:

DATE RANGE: 22-FEB-1985 THRU 31-DEC-9999
TIME RANGE: 14:00:00 THRU 14:35:59
MESSAGE TYPE: AL

WOULD YOU LIKE TO HAVE THE NTM LOG DISPLAYED? (Y/N):

PROCESSING IS COMPLETE

NUMBER OF RECORDS READ     = 0000000034
NUMBER OF MATCHES FOUND    = 0000000002

THE FOLLOWING FILE HAS BEEN CREATED CONTAINING 000000092 RECORDS -
NTMUTIL.DAT


THE FOLLOWING FILE HAS BEEN CREATED CONTAINING 000000092 RECORDS -
NTMRPT.DAT


WOULD YOU LIKE TO RUN THE NTM LOG UTILITY AGAIN? (Y/N): N
```

APPENDIX B

INSTALL NTM TABLE UTILITY

Purpose

This utility enables necessary tables to be added or deleted with minimum effort as requirements dictate.

Initial Choices

1. HOST	1. ADD
2. APC	2. CHANGE
3. AP	3. DELETE
4. DIRECTORY	4. VIEW
	5. EXIT

ADD

When adding a host or APC (Cluster), the program does not verify that the 3-character logical name chosen is unique, only that it does not contain imbedded blanks. When adding a new AP or directory name, the program will check to insure that the name is unique and does not contain imbedded blanks.

CHANGE

Portions of the change function are present but inoperative. When this function is added, these edit features should be included:

HOST TABLE - Logical host name remains unique.
Physical host name is valid.

APC TABLE - Cluster name remains unique.
Logical host name is unique and valid
(matches entry IS host table).

AP TABLES - Parameters within the APTTBL are valid.

DIRECTORY - Prefix or disk is valid.
Name is unique and has no imbedded blanks.

DELETE

When deleting a host, all associated clusters and APs are also deleted. When deleting a cluster, all associated APs are deleted. When deleting an AP, all entries in the ACTTBL, APITBL, and APTTBL are also deleted. When deleting a directory entry, each entry is deleted individually.

ADD, CHANGE, DELETE, or VIEW

With all functions comments and prompts are present to lead the user through the necessary program steps.

VIEW

This function displays the current tables on the screen in an easily readable format. For the view AP function, the user must select one of four choices:

1. ACT - Authority Table
2. API - AP Information
3. APT - Characteristics
4. AUT - Authority Table

APPENDIX C

ERRLOG UTILITY

Purpose

This utility provides a tool to list and format the ERRLOG file, which makes it somewhat easier to analyze. Date and time can be entered to analyze. Date and time can be entered to analyze specific ERRLOG entries.

Program Prompts

FILE NAME TO BE ANALYZED?	DEFAULT - ERRLOG.DAT
OUTPUT FILE TO BE CREATED? YES/NO	IF YES A FILENAME WILL BE REQUESTED.
SELECTION CRITERIA? DATE/TIME	IF ERRLOG FOR A SPECIFIC TIME RANGE IS DESIRED IT CAN BE ENTERED AT THIS TIME.
DESTINATION APPLICATION NAME? YES/NO	IF THE REPLY IS 'Y' ENTER 10 CHARACTER DESTINATION APPLICATION NAME. DEFAULT IS NTNTMONITV.
DESTINATION CLUSTER NAME?	IF THE REPLY IS 'Y' ENTER A 3 CHARACTER APPLICATION CLUSTER NAME. DEFAULT IS 'MRV'.
SOURCE APPLICATION NAME? YES/NO	IF THE REPLY IS 'Y' ENTER A 10 CHARACTER SOURCE APPLICATION PROGRAM NAME. DEFAULT IS 'NTNTMONITV'.
SOURCE APPLICATION PROGRAM CLUSTER NAME?	IF THE REPLY IS 'Y' ENTER A 3 CHARACTER SOURCE PROGRAM APPLICATION CLUSTER NAME. DEFAULT IS 'MRV'.
WOULD YOU LIKE TO CONTINUE?	IF THE REPLY IS 'Y' PROGRAM CONTINUES. 'N' PROGRAM TERMINATES.

IS THE ERRLOG TO BE DISPLAYED?	IF THE REPLY IS 'Y' FORMATTED OUTPUT APPEARS ON TERMINAL.
	'N' NO TERMINAL OUTPUT.

U.S.Government Printing Office: 1987 - 748-061/60908

END

7-87

DTIC